

Woody Vegetation: Sources, Propagules, and Techniques

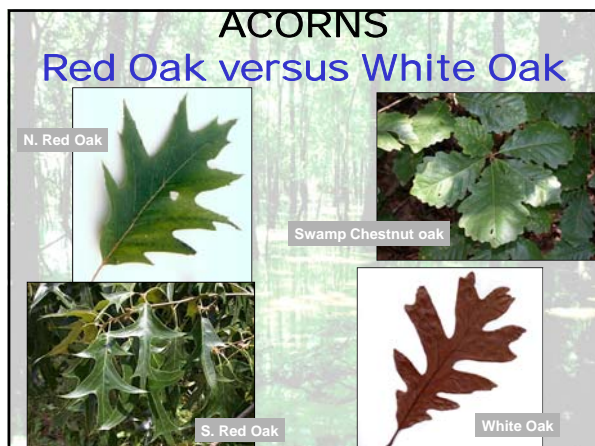


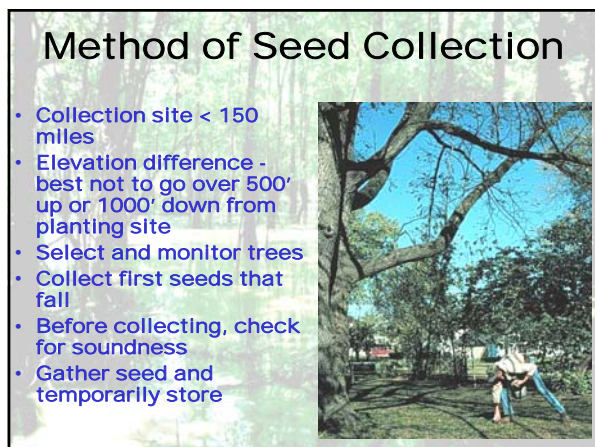
Objectives

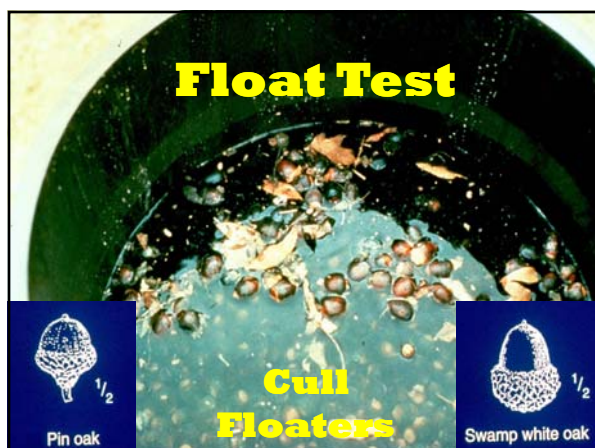
- List of propagule types available for revegetation of forested wetland types
- List the keys to successful of tree and shrub seedling planting
- Describe techniques used specifically for revegetation of the major forested wetland plant community types

Woody Species Seedling Types









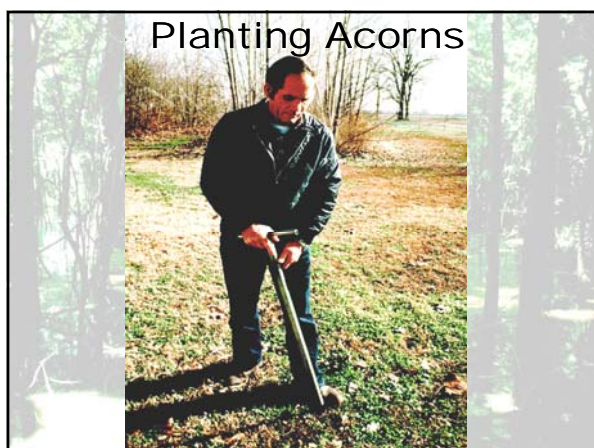
Storing Pin Oak Acorn



Storing Swamp White Oak

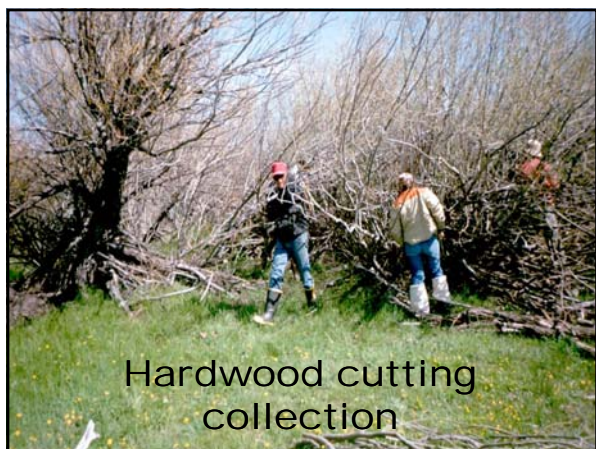


Planting Acorns









Hardwood Cutting Storage



- * Soak in water to swell the root primordia for a minimum of 24 hours, 7-14 days is better.
- * Roots will emerge after about 17 days or longer depending upon species
- * Soak the entire cutting in cold water

Grazing?

Beaver?

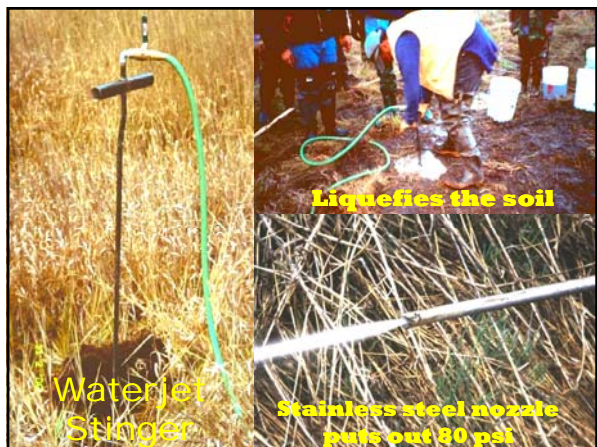
Be careful when soaking the cuttings



















Bare-root Seedlings

- **Attributes**
 - Min. 18 in. length
 - Larger the better
 - Less predation (voles, rabbits, ungulates, etc.)
 - Less competition loss from weeds, grasses, etc.
 - 3/8 in. collar
- **Roots**
 - Large fibrous root mass
 - Root mass should equal shoot mass
- **Planting**
 - Collar should be at ground surface or no more than 1/2 in. below depending upon frost heaving, soil settling, etc.



Storing Bare-root Seedlings

- Cold storage - 34° F to 39° F
- Heel in out of the sun and wind
- Temporary storage of seedlings on site
- Dense shade - few days
- Do not allow roots to freeze
- Do not allow the roots to dry out
 - Dip roots in Terrasorb



Bare Root Seedlings

Pros

- Lower cost per seedling
- Some tree planters are more familiar with planting
- Slightly more tolerant to deeper planting (traditional machine planting methods)
- More available in some areas, i.e., Louisiana, western Oregon

Cons

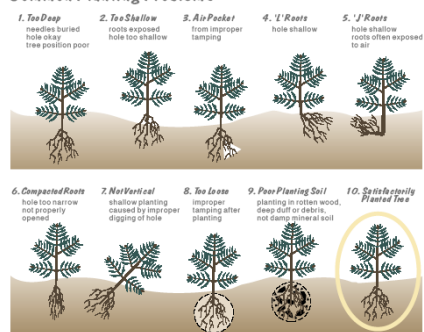
- Typically have lower survival than container (average 65% survival)
- More restrictive planting window
- More difficult to plant correctly by hand (e.g. without J-rooting or planting too deeply)
- Shorter storage time
- Need refrigerated storage

Planting in the Field

- Take only what will be planted in one day
- Do not let the roots dry out
- Make the hole is big enough for the roots
- Make sure the roots are spread out and planted downward
- Prevent air pockets around the roots



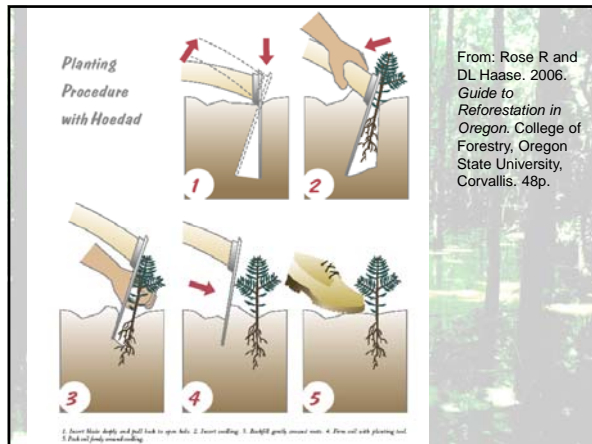
Common Planting Problems



From - Rose R and DL Haase. 2006. *Guide to Reforestation in Oregon*. College of Forestry, Oregon State University, Corvallis. 48p.

Signs of Poor Handling

- Dry Roots
- White Root Tips
- Too Much Soil (bare-root)
- Swollen or Burst Buds
- Mold on Needles or Stems
- Broken/Crushed Stems
- Ripped or Crushed Bags/Boxes



RPM Seedlings (Root Production Method)

- RPM trees are usually oak (or other hard mast producing species).
- The primary objective for using RPM trees is that they produce hard mast within 5 years as opposed to 15 - 20 for a typical planted oak seedling.

RPM Seedlings

- Cost
 - approximately \$9 / plant
 - \$2 for planting
 - \$0.50 - \$1 for fertilizing and matting.
- Planting rate
 - 25 - 30 seedlings per Acre
- Approximate total cost:
 - 30 tree/ac x \$13 / tree = \$390 / ac

RPM Seedlings

PRO'S:

- Produce hard mast within 5 years of planting (food for wildlife and seed source for regeneration).
- Useful in strategic planting
- Older seedlings are more apt to survive.
- Manufacturer generally guarantees survival for 1 year.

RPM Seedlings

CON'S

- High cost of individual trees
- Minimal number of trees / ac for wildlife
- Minimal acorn availability for forest regeneration if wildlife consume seed resulting in limited trees over the short term of establishment.


"Super Trees"

"Super Trees are those that can stop a speeding bullet. They generally are used in high stress situations, such as field borders in high elk areas, the end of shooting alleys, and as backdrops to gun clubs. Be careful to specify the species. Any sapling will stop a .22 but different species are rated for 30-30, 30-06, .50 cal assault. Handgun versions are available at request and can be fitted with 9mm, 357 mag, .45 ACP, and .45 LC. If the TSP contractor uses them, you qualify for Tier 3 for Wildlife Benefit since they can rest amongst the trees while you adjust your sights."

- Norm Melvin

"Super Trees"

- The primary objective for using super trees is to target Increased seedling survival in high stress situations (open water, wave action, wind scour, standing water, etc.).
- They are taller and more robust than their field grown equivalent



"Super Trees"

Method of Production:

- Seedling is container grown, heavily fertilized, and grown to optimize height.
- This is referred to as "forced growth".
- Seedlings are one year old when planted on site.

Specifications:

- Primarily oaks are used because of the cost per plant.
- Planted from 2 ½ gal pots
- 4 ft. height, ½ in. root collar
- planted with a 22" – 36" photodegradable tree tube.

"Super Trees"

- Cost: \$10 – 12 / Tree.
- Planting rate is made so that the cost is no more than normal seeding costs (about 40 – 45 cents/planted seedling).
- This equilibrates to about 10 – 11 trees/ ac.

"Super Trees"

Pros:

- Their increased vigor aids in success in high stress situations derived from environmental factors.
- They are taller and more robust with a greater chance of survival.
- Their tallness allows planting in inundated situations where overtopping by excess water would "drown out" shorter seedlings.

"Super Trees"

Con's:

- Cost is higher than field grown seedlings.
- Seedlings are often "weak stemmed", i.e., increased height (>4') but with little increased stem thickness (1/2" caliper minimum).
- Tree tubes must be used for protection and support.... Bluebird death traps.



Containerized Seedlings

- Seedlings are grown in containers.
- Each container contains a seedling, soil, and nutrients.
- These containerized seedlings are planted just about any time the soil is unfrozen.
- Spring and fall are generally the best times.
- Containerized seedlings have not experienced the root trauma of bare root stock when they are harvested.

Containerized Seedlings

Pros

- Higher survival than bareroot
- Lower cost per surviving seedling
- Easier to hand plant (thus less of a need to reduce logging slash on cutover sites)
- Store better and for longer periods
- Have a wider planting window
- Higher availability in some areas, i.e., Georgia, Florida and Alabama


Cons

- Higher cost per seedling
- Less tolerant of deep planting
- More bulky and thus more expensive to ship

Balled and Burlap

- Provide a larger, more robust plant that is large enough to give at least some structure to a new planting.
- Balled and burlap trees can provide immediate cover for wildlife, moderate hydrology, and when used has riparian planting can protect streambanks.
- However, balled and burlap plants can be expensive and cumbersome to establish.





Monitoring

Compare Project site with the established success criteria

- Estimate percent cover
- Determine plant density
- Determine species diversity

Stock type	Barney type	Typical size Height [ft.]	Caliper [in]	Advantages	Disadvantages
Styro 5	container	6-8	2-3	Slightly cheaper than 2x1	Must have excellent care and site prep. Less common type for reforestation. Costs slightly more than 1x1
Styro 6	container	9-12	3-5	Desired for ease of handling and planting	Not readily available without a contract. Costs more than a 2x1
Styro 15	container	10-16	4-6	Large seedling produced in one year	Costly. May require insect protection
Styro 20	container	14-20	4-6	Very large container seedlings	Costly
1x1	barroot	12-18	5-7	A transplant that can be large with a large caliper and root mass. Able to compete well on a brushy site and overcome animal damage.	Costs more than 2x1
		14-20	6-8	Larger 1x1s grown at lower seed density to have larger caliper and root mass. Cheaper than 2x1	Costly
Plug +1	container + barroot	12-18	5-9	Combination of a small plug and a barroot transplant. Has advantages of a large caliper tree. Wider selection of species than 1x1 transplants.	Difficult to obtain without a contract. Costly
2x1	barroot	18-20	6-9	Large trees for brushy sites	Other stock-type not commonly grown

Stock types – Pros and Cons

From: Rose R and DL Haase. 2006. *Guide to Reforestation in Oregon*. College of Forestry, Oregon State University, Corvallis. 48p.



Summary

- Vegetation establishment process
- Restoration techniques
- Handouts
